

What is claimed is:

1. ~~An electromechanical lock cylinder, comprising:~~
an outer shell having a bore formed therein and a
cavity extending from the bore into the shell;
5 a barrel disposed within the bore in the shell and
being rotatable relative thereto;
10 a side bar cooperating between the shell and the
barrel for selectively permitting and blocking rotation
of the barrel with respect to the shell, the side bar
having a first portion engaging the barrel and a second
portion (removably received in the cavity in the shell,
the side bar being movable relative to the barrel and the
shell;
a blocking mechanism positionable in a blocking
15 position relative to the side bar, which position blocks
motion of the side bar with respect to the shell, and
thereby prevents rotation of said barrel, and also
positionable in an unblocking position relative to the
side bar, which permits the side bar to be moved relative
20 to the cavity in the shell to allow the barrel to be
rotated with respect to the shell;
an electrically activated drive mechanism
cooperating with the blocking mechanism to selectively
move the blocking mechanism from the blocking position to
25 the unblocking position in which the side bar moves out
of the cavity upon rotation of the barrel; and
control means for activating the electrically
activated drive mechanism in response to an authorized
attempt to operate the lock cylinder.

2. A lock cylinder according to claim 1, wherein
said blocking mechanism comprises a slider bar movable

relative to the side bar, wherein in said unblocking position said slider bar is positioned adjacent to a recess^{located} in said side bar for receiving said slider bar upon rotation of said barrel.

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dial
groove
recess
I 3. A lock cylinder according to claim 1, wherein said blocking mechanism comprises a slider bar movable relative to the side bar, wherein in said unblocking position a recess in said slider bar is positioned adjacent to an extension in said side bar^{said recess} for receiving said extension upon rotation of said barrel.

4. A lock cylinder according to claim 1, wherein said electrically activated drive mechanism comprises a shape memory alloy actuator for moving said blocking mechanism to said unblocking position upon activation by passing electric current through said actuator.

5. A lock cylinder according to claim 2, wherein said electrically activated drive mechanism comprises a shape memory alloy actuator for moving said slider bar to said unblocking position upon activation by passing electric current through said actuator.

6. A lock cylinder according to claim 5, wherein said electrically activated drive mechanism further comprises a rocker attached to said shape memory alloy actuator and a pusher coupled between said rocker and said slider bar.

7. A lock cylinder according to claim 3, wherein said electrically activated drive mechanism comprises a shape memory alloy actuator for moving said slider bar to

said unblocking position upon activation by passing electric current through said actuator.

5 8. A lock cylinder according to claim 7, wherein said electrically activated drive mechanism further comprises a spring applying a force to said slider bar for biasing said slider bar in said blocking position when said shape memory alloy actuator is not activated.

9. A lock cylinder according to claim 4, wherein said shape memory alloy actuator is made of nitinol.

10 10. A lock cylinder according to claim 9, wherein said shape memory alloy actuator is in the form of a wire.

11. A lock cylinder according to claim 5, wherein said shape memory alloy actuator is made of nitinol.

12. A lock cylinder according to claim 7, wherein said shape memory alloy actuator is made of nitinol.

13. ~~An electromechanical lock cylinder, comprising:~~
an outer shell having a bore formed therein and a cavity extending from the bore into the shell;
a barrel disposed within the bore in the shell and being rotatable relative thereto;
a blocking mechanism for normally blocking rotation of said barrel and being movable to an unblocking position to permit rotation of said barrel; and
means cooperating with the blocking mechanism for selectively moving the blocking mechanism from the blocking position to the unblocking position upon

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Ant occurrence of a predetermined condition, said moving
means comprising a shape memory alloy actuator activated
by passing electrical current therethrough.

14. A lock cylinder according to claim 13, further
comprising a side bar cooperating between the shell and
the barrel for selectively permitting and blocking
rotation of the barrel with respect to the shell, the
5 side bar having a first portion engaging the barrel and a
second portion removably received in the cavity in the
shell, the side bar being movable relative to the barrel
and the shell;

10 said blocking mechanism including a slider bar
movable relative to the side bar, wherein in said
unblocking position a recess in said slider bar is
positioned adjacent to an extension in said side bar, ^{said recess} for
receiving said extension upon rotation of said barrel.

15. A lock cylinder according to claim 13, further
comprising a side bar cooperating between the shell and
the barrel for selectively permitting and blocking
rotation of the barrel with respect to the shell, the
5 side bar having a first portion engaging the barrel and a
second portion removably received in the cavity in the
shell, the side bar being movable relative to the barrel
and the shell;

10 said blocking mechanism including a slider bar
movable relative to the side bar, wherein said slider bar
is positioned adjacent to a recess, ^{located} in said side bar, for
receiving said slider bar upon rotation of said barrel.

16. A lock cylinder according to claim 15, wherein
said blocking mechanism further comprises a rocker

attached to said shape memory alloy actuator and a pusher coupled between said rocker and said slider bar.

17. A lock cylinder according to claim 13, further comprising control means, responsive to electrical data input from a key inserted into said lock cylinder, for causing said electrical current to be passed through said shape memory alloy actuator.

18. A lock cylinder according to claim 13, wherein said shape memory alloy actuator comprises a nitinol wire.

19. A lock cylinder according to claim 13, further comprising thermal interlock means for preventing operation of the lock cylinder upon external heating of said lock cylinder.

20. A lock cylinder according to claim 13, further comprising a plurality of tumbler pins cooperating between the shell and the barrel so as to block rotation of the barrel with respect to the shell in the absence of a properly bitted key, and to allow rotation of the barrel with respect to the shell upon insertion of a properly bitted key;

said blocking mechanism comprising a spinner which retractably engages at least one of said plurality of tumbler pins to prevent said at least one tumbler from moving to allow rotation of said barrel, said shape memory alloy actuator being activated to retract said spinner from engagement with said at least one tumbler pin.

21. ~~An electromechanical lock cylinder, comprising:~~
an outer shell having a bore formed therein and a
cavity extending from the bore into the shell;

a barrel disposed within the bore in the shell and
being rotatable relative thereto;

a blocking mechanism located in said barrel for
normally blocking rotation of said barrel and being
movable to an unblocking position to permit rotation of
said barrel; and

electronic control means located ~~at least~~ in said
~~lock cylinder~~ ^{barrel} cooperating with the blocking mechanism to
selectively move the blocking mechanism from the blocking
position to the unblocking position upon occurrence of a
~~predetermined condition.~~

Side bar for claim 22
22. A lock cylinder according to claim 21, further
comprising a nitinol wire actuator cooperating with said
electronic control means and said blocking mechanism for
causing said blocking mechanism to move to said
unblocking position upon passing of current through said
wire, ~~under control of said control means.~~

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23. A lock cylinder according to claim 22, further
comprising a side bar cooperating between the shell and
the barrel for selectively permitting and blocking
rotation of the barrel with respect to the shell, the
side bar having a first portion engaging the barrel and a
second portion removably received in the cavity in the
shell, the side bar being movable relative to the barrel
and the shell;

said blocking mechanism including a slider bar
movable relative to the side bar, wherein in said
unblocking position a recess in said slider bar is

positioned adjacent to an extension in said side bar for receiving said extension upon rotation of said barrel.

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5 24. A lock cylinder according to claim 22, further comprising a side bar cooperating between the shell and the barrel for selectively permitting and blocking rotation of the barrel with respect to the shell, the side bar having a first portion engaging the barrel and a second portion removably received in the cavity in the shell, the side bar being movable relative to the barrel and the shell;

10 said blocking mechanism including a slider bar movable relative to the side bar, wherein said slider bar is positioned adjacent to a recess ^{located} in said side bar, for receiving said slider bar upon rotation of said barrel.

25. A lock cylinder according to claim 24, wherein said blocking mechanism further comprises a rocker attached to said nitinol wire actuator and a pusher coupled between said rocker and said slider bar.

26. ~~A lock cylinder, comprising:
a shape memory alloy actuator for enabling operation of said lock cylinder by selective controlled application of heat to said actuator; and
thermal interlock protection means for preventing operation of said lock cylinder in the event of external heating of said lock cylinder.~~

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